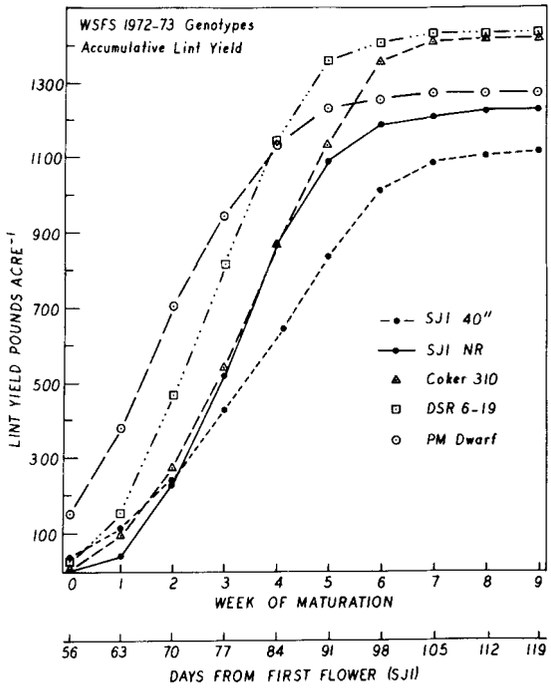
This research has demonstrated the potential of obtaining equal or higher yields than those obtained with the conventional wide-row system, with less time required to produce the crop. A plant type combining the proper growth and fruiting characteristics, fiber qualities, and disease resistance does not now exist. Also, the system of harvest (stripping) has many limitations. Adoption of this system on a wide scale will thus have to await the development of improved varieties and harvest equipment.

R. E. Johnson is Assistant Specialist, Department of Agronomy and Range Science, U.C., Davis; R. G. Curley is Engineer, U.C. Cooperative Extension, Davis; Alan George is Farm Advisor (Tulare County); O. D. McCutcheon is Farm Advisor (Kings County); V. T. Walhood is Research Plant Physiologist, ARS-USDA, Cotton Research Station, Shafter; C. R. Brooks is Assistant Development Engineer, U.C. Cooperative Extension, Davis; and Paul Young was Research Associate, U. S. Cotton Research Station, Shafter. *This research was supported by (1) California Planting Cotton Seed Distributors and (2) U. S. Department of Agriculture, with funds made available through Cotton Incorporated.*

LINT YIELD ACCUMULATION OF FOUR GENOTYPES IN NARROW ROWS AND ONE GENOTYPE IN WIDE ROWS.

Average of two experiments grown at the West Side Field Station in 1972 and 1973.



POLLEN *in*

J. C. CRANE · H. I. FORI

THE COMMERCIAL PISTACHIO nut tree (*Pistacia vera* L.), like all species of *Pistacia*, produces male and female flowers on separate trees. Male trees are strategically located among females in the orchard to provide pollen at the time the female flowers are receptive. Although the bloom period of the 'Peters' cultivar (male) generally overlaps that of 'Kerman' (currently the only female cultivar being planted commercially), in some years all the pollen is shed before the last of the 'Kerman' flowers is pollinated.

It has been suggested that some of the pollen produced earlier by 'Peters' or other male trees (i.e., *P. atlantica*) be collected and stored for use later in supplementing natural pollination. It has also been suggested that effort be directed toward developing a completely controlled artificial pollination procedure, in which pollen would be collected from male trees (not necessarily only those growing within the orchard), stored, and applied mechanically with dusting or spraying equipment. Such a procedure could eliminate use of valuable orchard space by male trees that serve only as sources of pollen.

As part of a general research program on the pistachio, various aspects of pollination have been studied. One of the most important of these is pollen longevity as affected by storage conditions.

The first step in a study of pollen viability is to determine the optimum sucrose concentration to use in the sugar-agar medium on which the pollen is to be germinated. Various concentrations were tested during each of three years, using pollen from several *Pistacia* species, with the data (see graph) indicating that a medium containing 10% cane sucrose and 1% agar promoted maximum germination. That sucrose concentration, therefore, was adopted as a standard in subsequent tests. Pollen was generally obtained by picking inflorescences just prior to anthesis, spreading them on paper in the laboratory at room temperature to dehisce, screening the pollen free of foreign material the next day, and pouring it into vials which were then stoppered with cotton plugs. Germination counts were made 24 hours after the pollen was dusted on the medium.

Viability of pollen shed from inflorescences in the orchard was compared with that of pollen shed from inflorescences picked and brought to the laboratory. In the former case, pollen was dusted on agar plates in the orchard, and percent germination was determined in the laboratory 24 hours later. In the latter instance, the pollen was not available until 24 hours after the inflorescences were picked, at which time it was dusted on the sugar-agar medium for germination. It was found that viability of pollen obtained from inflorescences in the laboratory was not greatly different from that obtained directly in the orchard. The average percent germination for six different tests during the bloom period was 52% for orchard pollen and 55% for laboratory pollen. The data also indicated that pollen viability tends to decrease as the period of bloom progresses. For example, pollen germination declined from 92% early in the bloom period to 51% ten days later.

In tests with several species and cultivars of *Pistacia*, the viability of freshly dehisced pollen held at room temperature rapidly deteriorated in three to four days to zero. Since storage studies with pollen from other plant species had indicated the value of low temperatures for preserving pollen viability, samples of pollen were stored in a refrigerator and a freezer. Refrigeration prolonged pollen viability by a few days, whereas freezing prolonged it as much as several months. However, depending upon the source of pollen and

ONGEVITY

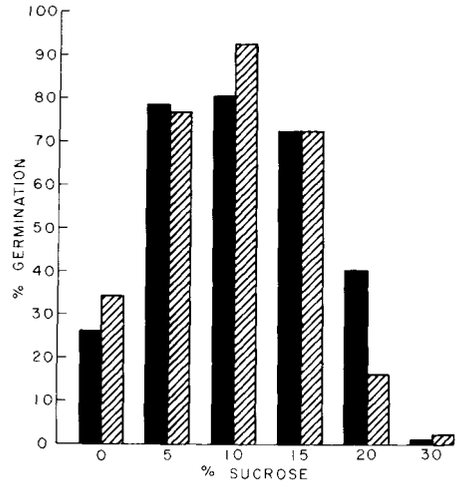
Pistacia

C. DANIEL

upon environmental conditions from year to year, the period of viability after storage in the freezer actually varied from 1 month to 52 months. A sample of 'Peters' pollen collected in March 1972 had 12% germination when last tested in July 1974. Flowers pollinated in April 1973 with that pollen collected a year previously produced normal nuts. In contrast, 'Peters' pollen collected in April 1974 and stored in a freezer had a viability of only 1% three months later (see photo).

Studies of different pollens by other investigators have indicated that moisture content of the pollen when placed in storage, and per cent relative humidity in storage, are factors which influence longevity. The yearly variations in per cent germination encountered in our study with pollen of the same cultivar are typical of those reported by others. Variation in per cent germination also occurs between duplicate samples of the same pollen. Also, in some cases, germination after storage for a few days is better than that of fresh pollen. In other instances, pollen samples may fail completely to germinate in consecutive tests, and then germinate well in a subsequent test. The data presented here, however, indicate clearly that cold temperatures prolong the period during which *Pistacia* pollen may be expected to germinate. Although research on storage of *Pistacia* pollen and its subsequent use has not passed the preliminary stage, this brief report is presented primarily to caution those contemplating the use of artificial pollination in pistachio culture.

Julian C. Crane is Professor, Department of Pomology, University of California, Davis. Harold I. Forde is Research Associate, and Charlene Daniel is a former student in plant science, at U.C. Davis.



THE INFLUENCE OF SUCROSE CONCENTRATION ON PER CENT GERMINATION OF 'PETERS' (CROSS-HATCHED) PISTACHIO POLLEN AND THAT FROM A SEEDLING TREE OF **P. ATLANTICA** (SOLID)

Pollen germination of 'Peters' pistachio: (left) 62% germination one day after collection; (right) 1% germination after storage in a freezer for three months.